

U.S. Patent Application Serial No. 10/608,546
Response dated Draft
Reply to OA of April 30, 2004

REMARKS

No amendment is made in this Response. It is believed that this Response is fully responsive to the Office Action dated April 30, 2004.

Claims 1-4 are rejected under 35 U.S.C. §102(e) as being anticipated by Parr et al. U.S.

Patent 6,703,134. (Office action paragraph no. 2 on page 2)

The rejection of claims 1-4 is respectfully traversed.

The Examiner cites Parr in column 3, lines 54 and 60-67 as disclosing syndiotactic polypropylene produced using a metallocene catalyst. The Examiner cites column 4, lines 5-12, as disclosing that the syndiotactic polypropylene may have 75-85% racemic pentad fraction.

Parr also states in column 4, lines 5-12:

“Additionally, the syndiotactic polypropylene may have a syndiotacticity of about 70-90% based on racemic pentads and 80-98% based on racemic dyads (measured according to ^{13}C NMR spectroscopy), preferably 75-85% based on racemic pentads.”

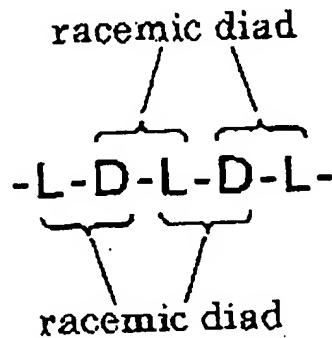
Applicant notes first of all that each of pending claims requires a racemic diad fraction of 0.51 to 0.88. This recited range of 0.51 to 0.88 overlaps the range of 0.80 to 0.98 (i.e., 80 to 98%) in column 4, line 6, of Parr et al. However, this disclosure in the reference clearly does not anticipate the claimed range.

Moreover, the value of racemic diads appears to be further limited in Parr than Parr’s value of 80 to 98% would suggest. The racemic pentad fraction in fact **limits the range of the racemic diad**. This can be explained based on the method for calculating the racemic pentad fraction (in

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other words, the probability of occurrence of a racemic pentad), which is commonly accepted in the field of structure regulated polymers.

As apparent from the following formula representing a racemic pentad in a polymer chain of a polypropylene (wherein L represents a propylene unit with L-configuration and D represents a propylene unit with D-configuration), the occurrence of a racemic pentad can be regarded as the consecutive occurrences of 5 racemic diads.



(Note: It is apparent to a person skilled in the art that the term "racemic" means an arrangement of propylene units in which propylene units with L-configuration and propylene units with D-configuration are alternately arranged.)

Therefore, the racemic pentad fraction in a polymer chain can be calculated as the probability of the consecutive occurrences of 5 racemic diads.

When the probability of the occurrence of a racemic diad (i.e., the racemic diad fraction) in a polymer chain is represented by P ($0 \leq P \leq 1$) the probability of the occurrence of a meso diad in the same chain is represented by the formula 1-P. In accordance with this definition, it is apparent that

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the probability of the occurrence of a racemic pentad in the same chain is represented by the formula P^5 .

As mentioned above, the range of the racemic pentad fraction disclosed in Parr et al. is 70 to 90 % (i.e., $0.7 \leq P^5 \leq 0.9$). This requires that the range of P in Parr et al. be, in fact, **0.931 to 0.979**.

Therefore, in Parr et al., in order to simultaneously achieve the racemic pentad fraction of 70 to 90 % and the racemic diad fraction of 80 to 98 %, the racemic diad fraction must be within the range of from **93.1 to 97.9 % (i.e., 0.931 to 0.979)**.

Given this range of racemic diad fraction in Parr et al., there is **no overlap** of Parr's range with the recited diad range of from **0.51 to 0.88** in the present claims. Therefore, the structure of the polypropylene used in Parr et al. is completely different from that of the polypropylene used in the present invention.

With regard to the possible issue of inherency of the present claim limitations in Parr's Examples, the Applicant has made every effort to obtain N99033 (Fina Oil & Chemical Company) used in Example 1 of Parr et al. in order to determine the properties thereof, but has failed to obtain it. Applicant believes that this material does not inherently meet the present claim limitations.

It is apparent that Parr et al. does not teach or suggest the limitations of the present claims. Claims 1-4 are therefore not anticipated, and are further non-obvious over, Parr et al.

Claims 1-4 are rejected under 35 U.S.C. §103(a) as being unpatentable over Parr et al.

U.S. Patent 6,703,134 or EP 0 457 291 (cited by applicants). (Office action paragraph no. 2, page 3)

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The rejection of claims 1-4 is respectfully traversed.

Applicants have above addressed the teachings of Parr et al., demonstrating that the racemic diad limitation of 0.51 to 0.88, recited in the present claims, is neither disclosed nor suggested by Parr et al.

The Examiner cites EP '291 for disclosing the use of a polypropylene (as a material of a modified polypropylene) with a syndiotactic (= racemic) pentad fraction of **70%** or more (for example, **0.935 and 0.83**). In accordance with the above-mentioned explanation, these pentad fraction values correspond to racemic diad fractions of **0.931 or more, with examples of 0.987 and 0.963**, respectively.

However, as noted above, the racemic diad fraction of the polypropylene used as a material of the modified polypropylene in the present claims is limited to **0.51 to 0.88**.

Therefore, the structure of the polypropylene used in EP '291 is completely different from that of the polypropylene used in the present invention. It is also clear that EP '291 does not suggest the diad fraction range of 0.51 to 0.88 of the present claims.

Therefore, claims 1-4 are non-obvious over Parr et al. (U.S. Patent 6,703,134) and EP 0 457 291, taken separately or in combination.

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If, for any reason, it is felt that this application is not now in condition for allowance, the Examiner is requested to contact Applicant's undersigned agent at the telephone number indicated below to arrange for an interview to expedite the disposition of this case.

In the event that this paper is not timely filed, Applicants respectfully petition for an appropriate extension of time. Please charge any fees for such an extension of time and any other fees which may be due with respect to this paper, to Deposit Account No. 01-2340.

Respectfully submitted,

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